

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 12 July 2001 (12.07.01)	<b>Applicant's or agent's file reference</b> 100 361
<b>International application No.</b> PCT/EP00/09525	<b>Priority date (day/month/year)</b> 28 September 1999 (28.09.99)
<b>International filing date (day/month/year)</b> 28 September 2000 (28.09.00)	
<b>Applicant</b> GRIMM, Rainer et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

27 April 2001 (27.04.01)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b>  Charlotte ENGER  Telephone No.: (41-22) 338.83.38
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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— With international search report.

— Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**Vehicle door and assembling method as well as disassembling method  
for the same**

The invention refers to a vehicle door with the characteristics of the preamble of Claim 1 as well as an assembling method for the same according to Claim 11 and a disassembling method for the same according to Claim 12. This may involve driver, passenger, rear side or rear doors as well as both pivoting and sliding doors, in which, therefore, pivoting or sliding hinges are used for opening, for example.

In conventional vehicle doors it is common to join a support element constituting the supporting structure to the outer panel by peripheral welding, flanging or glueing, and to install the vehicle door in this state, with or without functional parts, such as lock, hinges, window lifter and the like, already installed to the support element, to the door opening of the vehicle which is to be closed off. The connection takes place in the hinge area. The so-called setting of the door is an assembly process requiring considerable experience, since the door must sit precisely positioned in all three spatial coordinates. For instance, vehicle doors are supposed to have a uniform gap with respect to the chassis in the X and Z directions (longitudinal and vertical directions of the vehicle). In the Y direction (transverse direction of the vehicle), the outer

surface of the door should be as flush as possible with the rest of the car body. Therefore, the positioning accuracy must be visually checked after a preliminary installation of the vehicle door in the body and the door must be realigned in the body if necessary. In case the equipping of the door with functional parts such as window lifters and the like takes place only after the setting of the door in the body is finished, the subsequent weight increase of the door and thus a possibly changing position of the door with respect to the body must be taken into account during the initial setting of the door. Installation work in case of repairs to the vehicle door is equally difficult.

A corresponding vehicle of this class is already known from DE-A1-30 04 897 showing an outer panel element rigidly screwed together with a support element. Therefore, the entire adjusting work is to be made with the support element.

Proceeding from this, the invention is based on the object of achieving an easing of the perfectly fitted assembling for vehicle doors of this class.

This problem is solved by a vehicle door with the characteristics of Claim 1 as well as the corresponding assembling method according to Claim 11 and the disassembling method according to Claim 12.

By employing at least one adjustable spacer element that takes effect between the outer panel element and the support element, final manufacturing tolerances or a possibly not 100% aligned installation of the support element is compensated. Preferably, a settable plastic that is applied in the not-yet set state to the support element, the outer panel element or a possible stiffening element of sufficient material strength is used as the spacer element. If the outer panel element is now moved towards the support element with the support element already installed in the chassis then, shortly before it reaches the desired installation position, the settable plastic comes into contact with the

respective opposite component. The outer panel element is then moved into its desired final position, in which the peripheral gaps and the flushness exhibit the desired values. Since the outer panel element, preferably already surface-treated in this state, can be extraordinarily light, simple, in particular, automatable, handling devices for moving, holding and adjusting the outer panel element can be used. After reaching the desired final position, the outer panel element is held in this position long enough for the plastic to set sufficiently and thus the desired final dimension is in a sense "frozen in." Any tolerances between outer panel and support element are thus compensated for by the resulting final dimension of the spacer element, in particular, the settable plastic.

However, pure mechanical means as telescopic means like spacer bushes, for instance, can be considered as spacer elements. These mechanical means include fastening means such as screws or the like, in order to fix the outer panel in the assembled state. Specifically, spacer elements being effective in two, preferably in three, directions of space are preferred. This can be easily achieved by spacer elements made from settable plastic.

It is particularly preferable for the spacer element to also take on a fastening function. With settable plastic as a spacer element, therefore, an adhesion can also be brought about, if desired.

Heat-sensitive spacer elements as thermoplasts or hot-melt-type adhesive allow a readjusting and/or disengageable connection of the outer panel with the support element or the stiffening element. Heating means for readjusting the heat-sensitive spacer elements or disengaging the outer panel can be placed nearby the heat-sensitive spacer elements as well as can be integrated into the vehicle door.

The outer panel element can be kept very thin-walled, so that it is very flexible

in the initial assembly. Likewise, the support element as such can be designed with respect to its stiffness such that this stiffness does not suffice by itself for the finished vehicle door. In the first case as well as in the second case, and also if both cases apply, the ultimately desired stiffness can be achieved by at least one, and preferably several, elongated stiffening elements, preferably linked together in the form of a frame, for the outer panel element and/or the support element. To this end, the stiffening element is preferably provided in the peripheral area of the service opening.

If such a stiffening element can be detachably joined to the support element, this has the effect, first of all, that the stiffening element can already be joined to the support element while setting the support element in the chassis, that is to say, its weight is taken into account during alignment and its stiffening effect is exerted on the support element. If in this case the outer panel element is joined to the stiffening element during the later closing of the service opening essentially to maintain a spacing, then the contact surface between stiffening element and support element serves as a later separation plane in case of maintenance work or the like on the functional parts of the door that may be necessary. Since the stiffening element is joined to the outer panel element in this case in a manner that fits - the specific door opening - perfectly, the stiffening element constitutes a structural unit with the outer panel element after initial assembly. Due to the detachability of the stiffening element from the support element, then, this component can later be removed as a complete assembly, with the stiffening element providing the relatively thin-walled outer panel element with sufficient stiffness that, even under shop conditions, an exposure of the service opening and subsequent reclosure is possible without problems.

The support element equipped with all functional parts can be inserted into the chassis and connected to it before the outer panel is applied. The equipping of the support element with functional parts can also take place before and/or

after fastening the support element to the chassis and an alignment of the support element with respect to the chassis can be carried out in a single work sequence without opening and again closing the support element. The adjustment of the support element can be accomplished with the aid of assembly blocks known from other fields, which indicate the final dimensions reached after the later placement of the outer panel element. The connecting of the support element with the outer panel element can take place in various ways, for instance, by blind bolting (bolting from the inside) and/or by glueing together.

The aforementioned components to be used according to the invention, as well as those claimed and described in the embodiments, are not subject to any special requirements regarding their size, shaping, material selection or technical conception, so that the selection criteria familiar in the respective field of application can be applied without restriction within the scope of the claims.

Additional details, characteristics and advantages of the object of the invention result from the subordinate claims as well as the description below of the associated drawing in which, for the sake of example, preferred embodiments of the vehicle door are presented. Shown in the drawing are:

Figure 1 a vehicle with the driver-side door, partially in an exploded view;

Figure 2 a passenger-side door for the same vehicle, partially in an exploded view;

Figure 3A the vehicle door of Figure 1 in a horizontal sectional representation (in part) - section along the line IIIA-IIIA according to Figure 1;

## 6

Figure 3B an additional horizontal section (in part) of the same vehicle door-section along line IIIB-IIIB according to Figure 1;

Figure 4 a vertical sectional view of the door of Figure 1 or Figure 2 in the sill area with a raised window pane;

Figure 5 an alternative embodiment of a vehicle door in vertical section through the lower area (rocker panel area);

Figure 6 a vehicle door with mechanical spacer elements being effective in three dimensions of space;

Figure 7 a vehicle door with a integrated disassembling device.

As is best seen from Figure 2, a vehicle door, here a passenger door, has a support element 12 of sheet metal, which is designed as a deep-drawn part and is essentially free of openings, or in which any openings can be tightly covered, in order to obtain a dry space for electrical components on the vehicle interior side of support element 12. This inner side is covered by a conventional interior panel element 16, made of plastic, for instance. As is further evident from Figures 1 and 2, the outer panel element 14 represents an independent component, which is put in place on the support element from the outside only after the installation of the preferably already completely equipped support element 12 in the vehicle chassis and after alignment has been performed. As is additionally visible from Figure 1, various functional parts such as hinges 18, a closure element 20, a side-impact beam 30 and stiffening elements 24 are accessible on the outside 12A of the support element 12.

In order that the vehicle door can be initially installed in the vehicle chassis without an outer panel element 14 and aligned there, the support element 12 has a large service opening 22, which is surrounded by a frame-shaped



stiffening element 24, on its outer side 12A.

As is evident from Figures 3A-5 in detail, the stiffening element 24 consists of an essentially frame-shaped structure whose spanned area corresponds roughly to the opaque part of the door, that is, the part not having a window pane. In the area of the A-pillar, the B-pillar and for the C-pillar of the vehicle, as well as in the rocker panel area (Figure 5), the stiffening element 24 consists of a tube of roughly trapezoidal cross section. The sill area (Figure 4) consists of a so-called shaft reinforcement 24'. In the corner areas, the four stiffening elements 24, 24' are rigidly connected, not shown in further detail.

According to Figure 3A and Figure 3B the stiffening element 24 has a continuous sealing surface 24A, with which it can be joined to the outer panel element 14 in the edge area 14A. An adjustable-thickness spacer element 26 of hardenable plastic, in particular of a heat-sensitive plastic, reversible as a hot-melt-type adhesive, is used for this joint. The stiffening element 24, moreover, can be detachably bolted to the support element 12 from the inside with bolts 32. During the setting and alignment of the support element in the vehicle chassis, the stiffening element 24 is already firmly bolted to the support element 12, while the outer panel element 14 is still absent. Conventional alignment screws for the door are accessible from the outside through the service opening 22. After the end of this alignment process, the outer panel element 14, which is an already finish-painted deep-drawn piece of, for instance, sheet metal, provided with angled flanges 14B, is moved up to the stiffening element 14 with conventionally known handling equipment. Previously, the outside of the stiffening element 24 or the inside of the outer panel element 14 in the area of the edges is continuously coated, at least in the area of A-, B- and/or C-pillars and the rocker panel with overdimension, with not-yet reacted and sufficiently thixotropic adhesive with filling and sealing characteristics. After the outer panel element 14 has been brought into its final position shown in Figure 3A, it is held there for sufficient time for the plastic

that constitutes the spacing element 26 to adequately harden. Thus, the vehicle door 10 is closed off water-tight against the outside. In case of repairs, the bolts 32 must be loosened from the inside and the spacing element 26 cut free at its narrow contact face with the support element 12 in order to be able to remove the outer panel element 14 together with the stiffening elements 24.

A side-impact beam 30, as shown in Figure 3B, can be fastened to the support element 12 by means of angle brackets 30A without any resulting physical contact with the outer panel element 14. The side-impact beam 30, however, can equally well be joined in a precisely fitted manner to the outer panel element 14 by additional spacing elements 26, in the same manner as the stiffening element 24. In the rocker panel area, inclined run-off surfaces 26A of the spacing element 26 ensure that any condensate or penetrating water can run off via known drainage holes 34.

Fig. 6 shows the embodiment of Fig. 3A - with exception of the spacing element, which exists of two or three mechanical spacer means 26D in Fig. 6, being of adjustable and fixable length.

Fig. 7 shows the embodiment of Fig. 3B - with exception of the spacing element, which exists of a heat-sensitive spacer element 26B in Fig. 7, being made of a heat-sensitive plastic material like a hot-melt or thermoplastic resin. An, e.g. electrically operated, heating means 26D being closely positioned with respect to the heat-sensitive spacer element 26B, allows to detach the outer panel element 14 upon heating action by heating means 26D. - This device and method for disassembling structural or functional parts may be advantageously by used in various other applications, particularly in the field of vehicle building and is - insofar - of own valuable technical meaning - even independently from the invention claimed in Claim 1.

List of reference numerals

	10	Vehicle door
	12	Support element
5	12A	Outside
	14	Outer panel element
	14A	Edge zone
	14B	Flanges
	16	Interior panel element
10	18	Hinge
	20	Closure element
	22	Service opening
	24	Stiffening element
	24'	Shaft reinforcement
15	24A	Sealing surface
	26B	Heat-sensitive spacer elements
	26C	Heating means
	26D	Mechanical spacer means
	26	Spacing element
20	26A	Run-off surfaces
	28	Hollow chamber
	30	Side-impact beam
	30A	Angle brackets
	32	Bolts
25	34	Drainage holes
	36	Window pane

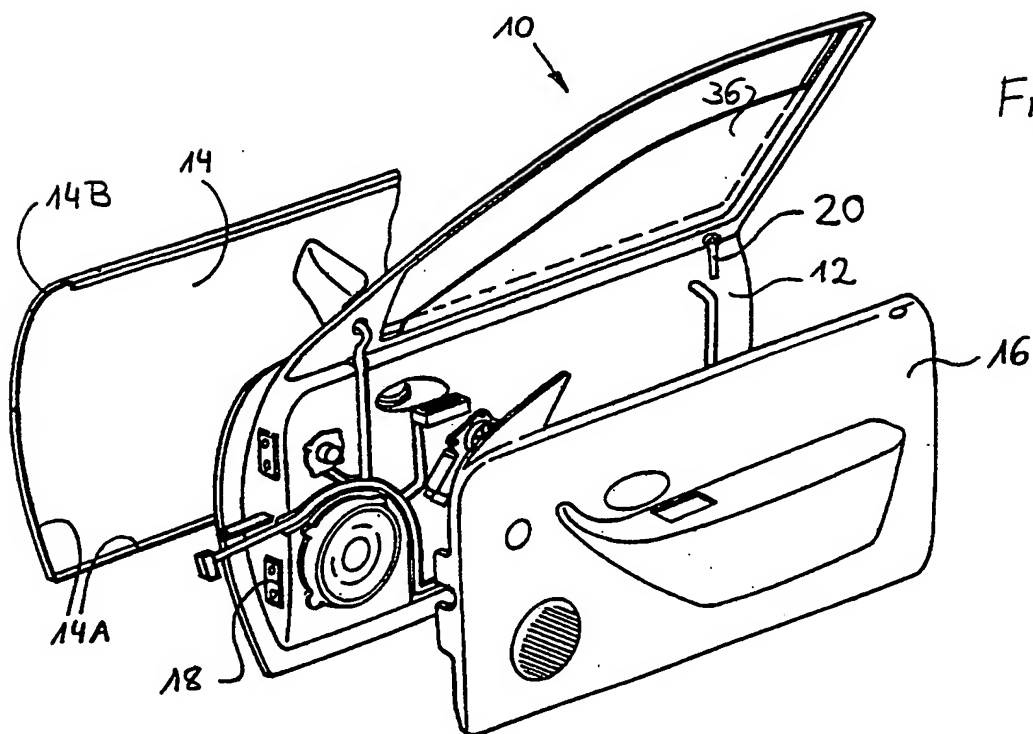
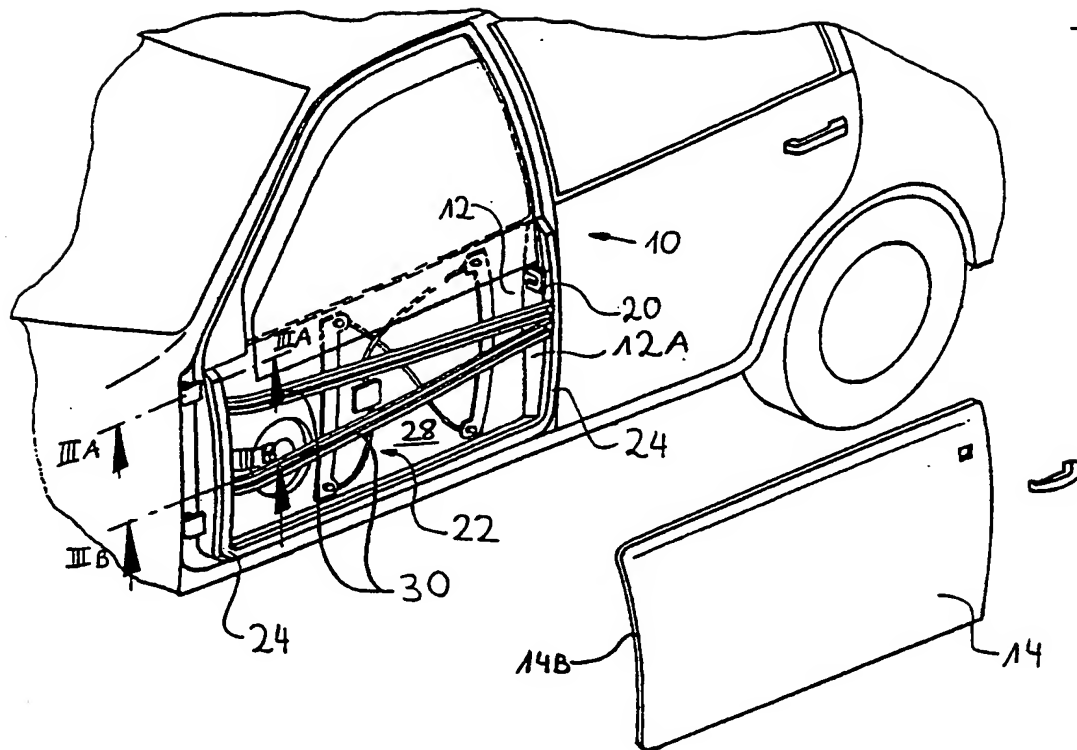
Claims

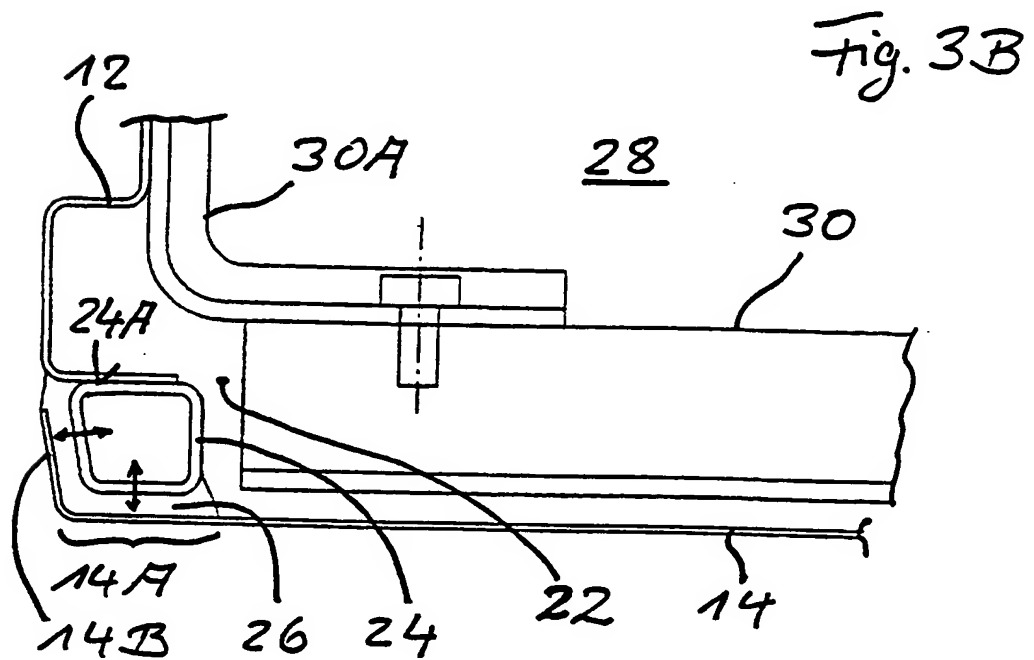
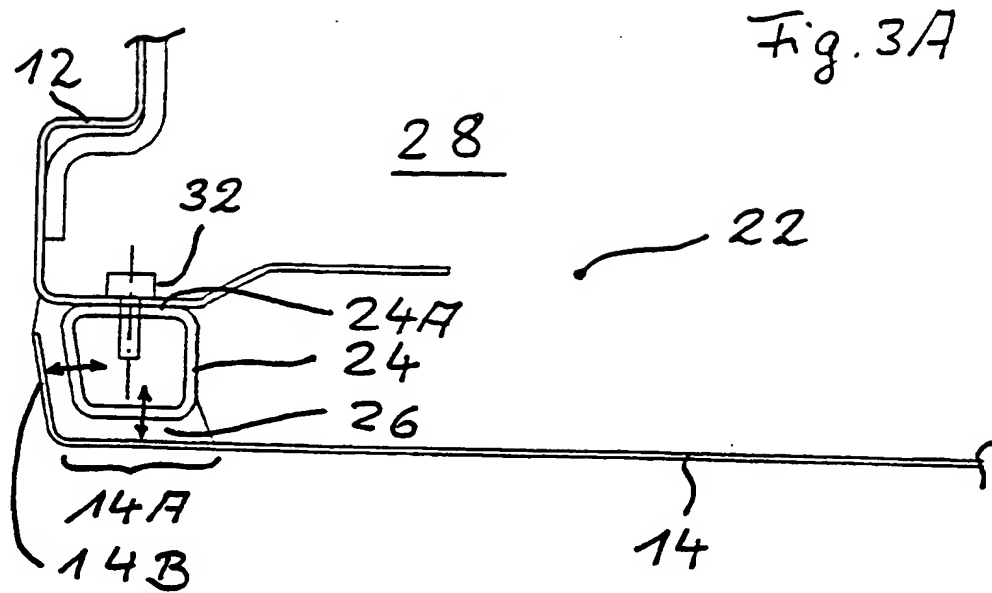
1. Vehicle door consisting of at least one support element (12), at least one outer panel element (14) and optionally an interior panel element (16), in which the support element (12) contains at least one hinge, hinge plate or similar moving element (18) and/or a closure element (20)  
5 or the support element (12) is or can be connected to the latter, wherein the support element (12) has a service opening (22) on its outer side (12A) and the service opening (22) can be closed off by means of the outer panel element (14), in particular, with the support element (12) already installed in the vehicle,  
10 characterized in that the outer panel element (14) is or can be provided in at least part of its edge zones (14A) with an adjustable spacing element (26) for precisely positioned fastening of the outer panel element (14) to the support element (12) and/or the stiffening element (24).  
15
2. Vehicle door according to Claim 1, characterized in that the spacing element (26) is a settable plastic.
3. Vehicle door according to Claim 2, characterized in that the settable  
20 plastic is a heat-sensitive adhesive.
4. Vehicle door according to Claim 3, characterized in that the heat-sensitive adhesive is reversibly heat-sensitive.
- 25 5. Vehicle door according to any of the Claims 1 to 4, characterized in that the spacer element (26) also serves as connecting element of the outer panel element (14) with the support element (12) or with the stiffening element (24).

6. Vehicle door according to any of the Claims 1 to 5 characterized in that the spacer elements are movable and adjustable in at least two directions of space.
- 5 7. Vehicle door according to any of the Claims 1 to 6, characterized by at least one elongated, in particular, frame-shaped stiffening element (24) for the outer panel element (14) and/or the support element (12), preferably provided in the edge areas of the service opening.
- 10 8. Vehicle door according to any of the Claims 1 to 7, characterized in that the stiffening element (24) or the outer panel element can be detachably joined to the support element (12).
- 15 9. Vehicle door according to Claim 8, characterized in that the stiffening element (24) has a continuous sealing surface (24A) with respect to the support element (12).
- 20 10. Vehicle door according to any of Claims 1 to 9, characterized in that the support element (12) and the outer panel element (14) form, in particular, a completely enclosed hollow chamber (28).
- 25 11. Method of assembling a vehicle door according to any of Claims 1 to 10, characterized in that the preassembled vehicle door is firstly mounted and adjusted to the vehicle body and thereafter the outer panel element (14) of the door is brought into contact with an adjustable spacing element (26) being intermediate to the mounted door, and thereafter bringing the outer panel element (14) into its final position under adjustment action of the adjustable spacing element (26), and then fixing the adjustable spacing element (26) in its final position or configuration.

## 12

12. Method for disassembling the outer panel element (14) of a vehicle door (10) according to any of the Claims 1 to 10, characterized by heating a heat-sensitive spacer element 26B being used as said adjustable spacing element (26) with heating means (26C) being mounted to the vehicle door (10) and removing the outer panel element (14) afterwards.







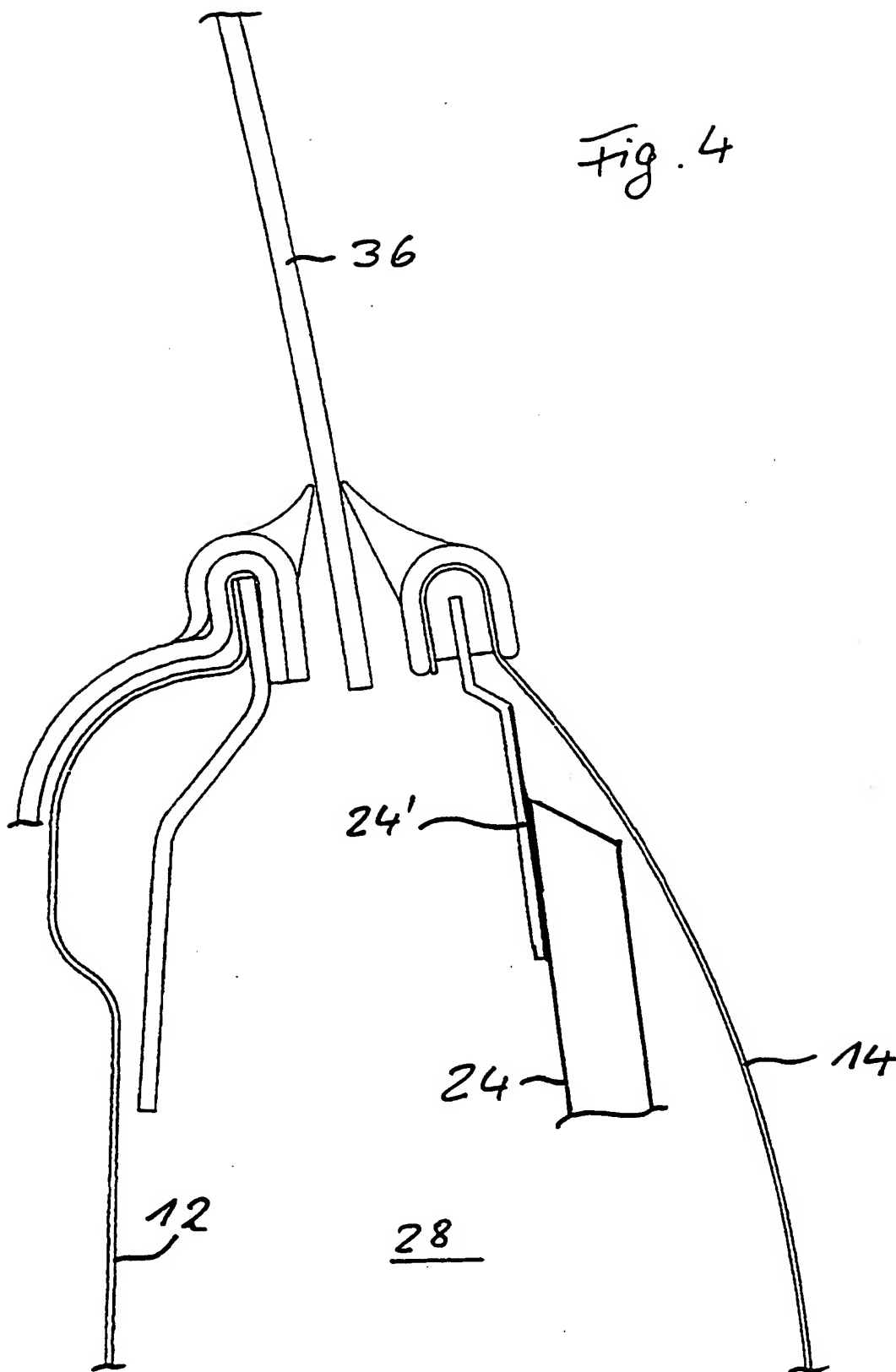


Fig. 5

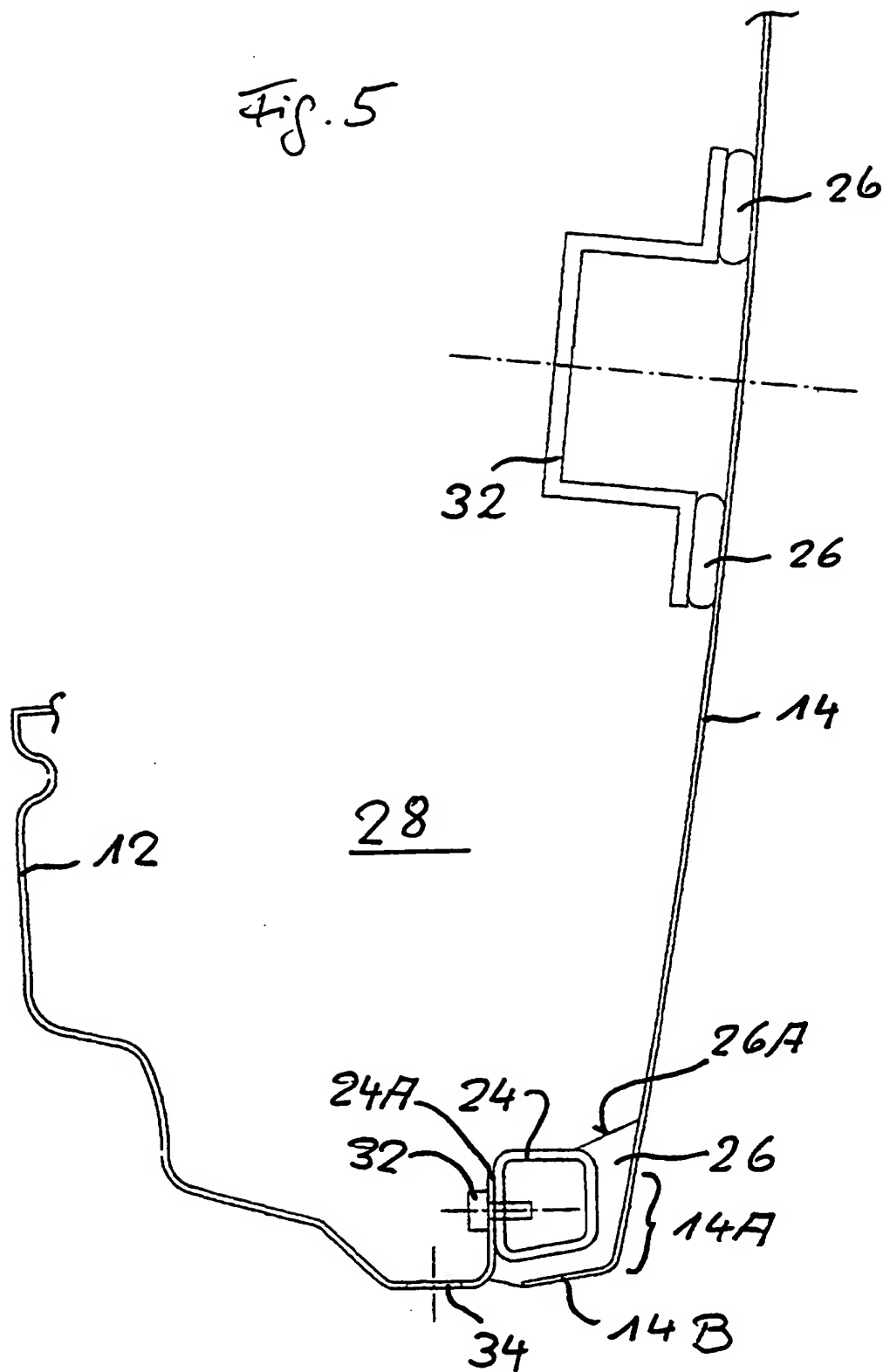


Fig. 6

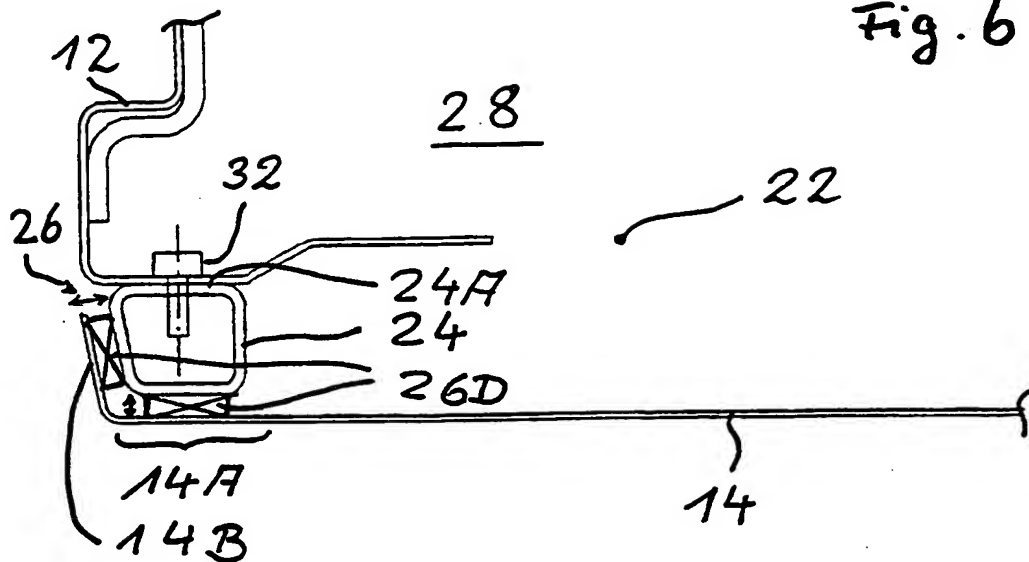
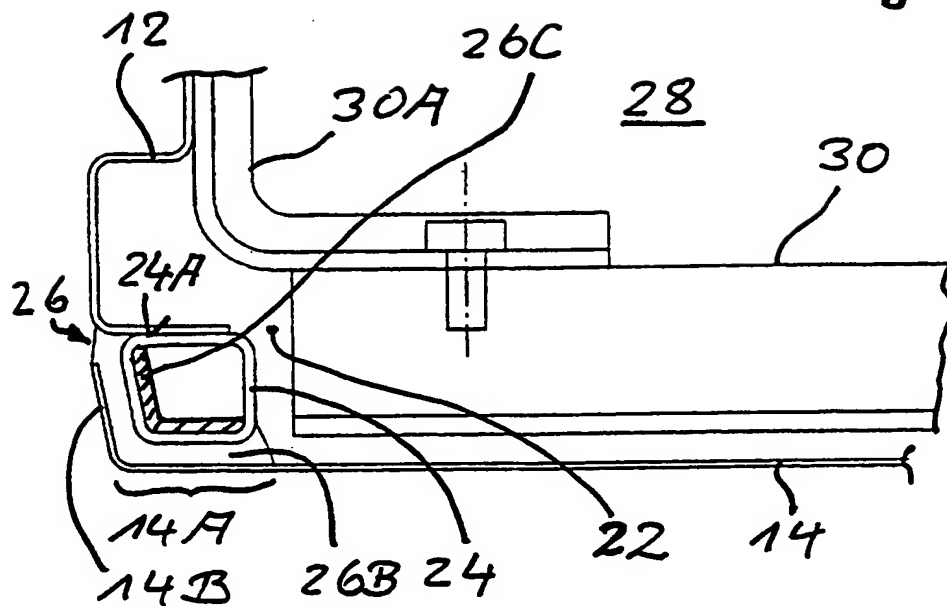


Fig. 7



# INTERNATIONAL SEARCH REPORT

Intern. Application No

PCT/00/09525

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B60J5/04 B62D65/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60J B62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 30 04 897 A (FEUCHT) 27 August 1981 (1981-08-27) cited in the application claims; figures	1,11,12
A	EP 0 579 006 A (YMOS) 19 January 1994 (1994-01-19) column 3, line 16 -column 5, line 30; figures	1
A	US 4 704 822 A (RAINER SROCK) 10 November 1987 (1987-11-10) column 3, line 38 -column 4, line 25; figures	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*S\* document member of the same patent family

Date of the actual completion of the international search

23 January 2001

Date of mailing of the international search report

29/01/2001

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
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Fax: (+31-70) 340-3016

Authorized officer

Vanneste, M

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/90/09525

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3004897 A	27-08-1981	US 4416088 A	22-11-1983
EP 579006 A	19-01-1994	DE 4221795 A	13-01-1994
		DE 59307378 D	23-10-1997
		ES 2107590 T	01-12-1997
		US 5787645 A	04-08-1998
US 4704822 A	10-11-1987	DE 3537303 A	23-04-1987
		DE 3661506 D	02-02-1989
		EP 0222990 A	27-05-1987
		JP 62099209 A	08-05-1987

## PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

KÖNIG PALGEN SCHUMACHER KLUIN  
Frühlingstrasse 48A KÖNIG · PALGEN  
45133 Essen SCHUMACHER · KLUIN  
ALLEMAGNE

19/12/00  
16. DEZ. 2000

Frist:

erledigt:

Date of mailing (day/month/year) 30 November 2000 (30.11.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 100 361 ✓	
International application No. PCT/EP00/09525 ✓	International filing date (day/month/year) 28 September 2000 (28.09.00) ✓
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 28 September 1999 (28.09.99) ✓
Applicant MERITOR AUTOMOTIVE GMBH et al ✓	

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
28 Sept 1999 (28.09.99) ✓	199 46 307.7 ✓	DE ✓	27 Nove 2000 (27.11.00)

The International Bureau of WIPO  
34, chemin des Capucines  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Magda BOUACHA

B

Telephone No. (41-22) 338.83.38

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>100 361</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 00/ 09525</b>	International filing date (day/month/year) <b>28/09/2000</b>	(Earliest) Priority Date (day/month/year) <b>28/09/1999</b>
Applicant <b>MERITOR AUTOMOTIVE GMBH et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

3a \_\_\_\_\_

☐ None of the figures.

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B60J5/04 B62D65/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B60J B62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 30 04 897 A (FEUCHT) 27 August 1981 (1981-08-27) cited in the application claims; figures ---	1, 11, 12
A	EP 0 579 006 A (YMOS) 19 January 1994 (1994-01-19) column 3, line 16 -column 5, line 30; figures ---	1
A-	US 4 704 822 A (RAINER SROCK) 10 November 1987 (1987-11-10) column 3, line 38 -column 4, line 25; figures -----	1

☐ Further documents are listed in the continuation of box C.

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\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

23 January 2001

Date of mailing of the international search report

29/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Vanneste, M



Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3004897 A	27-08-1981	US 4416088 A	22-11-1983
EP 579006 A	19-01-1994	DE 4221795 A	13-01-1994
		DE 59307378 D	23-10-1997
		ES 2107590 T	01-12-1997
		US 5787645 A	04-08-1998
US 4704822 A	10-11-1987	DE 3537303 A	23-04-1987
		DE 3661506 D	02-02-1989
		EP 0222990 A	27-05-1987
		JP 62099209 A	08-05-1987

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/

# PCT

## DEMAND

### CHAPTER II

under Article 31 of the Patent Cooperation Treaty:  
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference 100 361
International application No. PCT/EP 00/09525	International filing date (day/month/year) 28. September 2000 (28/09/2000)	(Earliest) Priority date (day/month/year) 28. September 1999 (28/09/1999)
Title of invention Vehicle door and assembling method as well as disassembling method for the same		
<b>Box No. II APPLICANT(S)</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  Meritor Automotive GmbH Hanauer Landstraße 338  D - 60314 Frankfurt/Main DE		Telephone No.  Facsimile No.  Teleprinter No.  Applicant's registration No. with the Office
State (that is, country) of nationality: DE		State (that is, country) of residence: DE
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  GRIMM, Rainer Sachsenhäuser Landwehrweg 225  D - 60599 Frankfurt DE		
State (that is, country) of nationality: DE		State (that is, country) of residence: DE
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  KÖLLNER, Harald Blütenweg 15  D - 63674 Altenstadt DE		
State (that is, country) of nationality: DE		State (that is, country) of residence: DE
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.		

## Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

STRAUB, Klaus-Dieter  
Nordendorfsweg 27

D - 38110 Braunschweig  
DE

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

WURM, Georg  
Usinger Weg 38b

D - 61350 Bad Homburg  
DE

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

DREWNIOK, Daniel  
Rodheimer Strasse 11

D - 60385 Frankfurt  
DE

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

HERWIG, Arnd G.  
Röderweg 24

D - 96148 Baunach  
DE

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

☒ Further applicants are indicated on another continuation sheet.

## Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

HOF, Patrick  
Eichgarten 14

D - 35043 Marburg  
DE

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

DOBSON, Simon Blair  
5, the Corniche  
Sandgate, Folkestone  
Kent CT20 3TA  
Great Britain

GB

State (that is, country) of nationality:

GB

State (that is, country) of residence:

GB

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

KEYES, Gregory  
28 Inverclyde Road  
Handsworth Wood  
Birmingham B20 2LJ  
Great Britain

GB

State (that is, country) of nationality:

GB

State (that is, country) of residence:

GB

Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)

SCHANG, Kenneth W.  
46131 Academy  
Plymouth, Michigan 48170  
U.S.A.

US

State (that is, country) of nationality:

US

State (that is, country) of residence:

US

☐ Further applicants are indicated on another continuation sheet.

**Box No. III AGENT OR COMMON REPRESENTATIVE: OR ADDRESS FOR CORRESPONDENCE**The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: (Family name followed by given name; for a legal entity, full official designation.  
The address must include postal code and name of country.)KÖNIG PALGEN SCHUMACHER KLUIN  
Frühlingstraße 43A  
D - 45133 Essen  
DE

Telephone No.

+49/201/842300

Facsimile No.

+49/201/8423020

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed☐ as amended under Article 34the claims ☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.)

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

## Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |   |        |
|--|---|--------|
| 1. translation of international application                              | : | sheets |
| 2. amendments under Article 34   | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | : | sheets |
| 5. letter  | : | sheets |
| 6. other (specify)   | : | sheets |

For International Preliminary  
Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |   |  |
|---|--|
| 1. <input type="checkbox"/> fee calculation sheet   | 5. <input type="checkbox"/> statement explaining lack of signature     |
| 2. <input type="checkbox"/> original separate power of attorney                             | 6. <input type="checkbox"/> sequence listing in computer readable form |
| 3. <input type="checkbox"/> original general power of attorney                              | 7. <input checked="" type="checkbox"/> other (specify):                |
| 4. <input type="checkbox"/> copy of general power of attorney:<br>reference number, if any: | Abbuchungsauftrag<br>EPA Form 1010                                     |

## Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Essen, April 27, 2001

The Patent Attorney:



(Dr. Horst Schumacher)

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For recording Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference 100 361  
(if desired) (12 characters maximum)

### Box No. I TITLE OF INVENTION

Vehicle door and assembling method as well as disassembling method for the same

### Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Meritor Automotive GmbH  
Hanauer Landstraße 338

D - 60314 Frankfurt/Main  
DE

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

GRIMM, Rainer  
Sachsenhäuser Landwehrweg 225

D - 60599 Frankfurt  
DE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KÖNIG PALGEN SCHUMACHER KLUIN  
Patent Attorneys  
Frühlingstraße 43A  
D - 45133 Essen

DE

Telephone No.

+49/201/842300

Facsimile No.

+49/201/8423020

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

KÖLLNER, Harald  
Blütenweg 15

D - 63674 Altenstadt  
DE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

STRAUB, Klaus-Dieter  
Nordendorfsweg 27

D - 38110 Braunschweig  
DE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

WURM, Georg  
Usinger Weg 38b

D - 61350 Bad Homburg  
DE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

DREWNIOK, Daniel  
Rodheimer Strasse 11

D - 60385 Frankfurt  
DE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

DE

State (that is, country) of residence:

DE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on another continuation sheet.



## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

HERWIG, Arnd G.  
Röderweg 24

D - 96148 Baunach  
DE

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
DE

State (that is, country) of residence:  
DE

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

HOF, Patrick  
Eichgarten 14

D - 35043 Marburg  
DE

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
DE

State (that is, country) of residence:  
DE

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

DOBSON, Simon Blair  
5, the Corniche  
Sandgate, Folkestone  
Kent CT20 3TA  
Great Britain  
GB-

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

KEYES, Gregory  
28 Inverclyde Road  
Handsworth Wood  
Birmingham B20 2LJ  
Great Britain

GB

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on another continuation sheet.

## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

SCHANG, Kenneth W.  
46131 Academy  
Plymouth, Michigan 48170  
U.S.A.

US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

US

State (that is, country) of residence:

US

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

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Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; **at least one must be marked**):

**Regional Patent**

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> <b>AE</b> United Arab Emirates                  | <input checked="" type="checkbox"/> <b>LC</b> Saint Lucia  |
| <input checked="" type="checkbox"/> <b>AG</b> Antigua and Barbuda                   | <input checked="" type="checkbox"/> <b>LK</b> Sri Lanka  |
| <input checked="" type="checkbox"/> <b>AL</b> Albania                               | <input checked="" type="checkbox"/> <b>LR</b> Liberia  |
| <input checked="" type="checkbox"/> <b>AM</b> Armenia                               | <input checked="" type="checkbox"/> <b>LS</b> Lesotho  |
| <input checked="" type="checkbox"/> <b>AT</b> Austria                               | <input checked="" type="checkbox"/> <b>LT</b> Lithuania  |
| <input checked="" type="checkbox"/> <b>AU</b> Australia                             | <input checked="" type="checkbox"/> <b>LU</b> Luxembourg   |
| <input checked="" type="checkbox"/> <b>AZ</b> Azerbaijan                            | <input checked="" type="checkbox"/> <b>LV</b> Latvia   |
| <input checked="" type="checkbox"/> <b>BA</b> Bosnia and Herzegovina                | <input checked="" type="checkbox"/> <b>MA</b> Morocco  |
| <input checked="" type="checkbox"/> <b>BB</b> Barbados                              | <input checked="" type="checkbox"/> <b>MD</b> Republic of Moldova  |
| <input checked="" type="checkbox"/> <b>BG</b> Bulgaria                              | <input checked="" type="checkbox"/> <b>MG</b> Madagascar   |
| <input checked="" type="checkbox"/> <b>BR</b> Brazil                                | <input checked="" type="checkbox"/> <b>MK</b> The former Yugoslav Republic of Macedonia                    |
| <input checked="" type="checkbox"/> <b>BY</b> Belarus                               | <input checked="" type="checkbox"/> <b>MN</b> Mongolia   |
| <input checked="" type="checkbox"/> <b>BZ</b> Belize                                | <input checked="" type="checkbox"/> <b>MW</b> Malawi   |
| <input checked="" type="checkbox"/> <b>CA</b> Canada                                | <input checked="" type="checkbox"/> <b>MX</b> Mexico   |
| <input checked="" type="checkbox"/> <b>CH and LI</b> Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> <b>MZ</b> Mozambique   |
| <input checked="" type="checkbox"/> <b>CN</b> China                                 | <input checked="" type="checkbox"/> <b>NO</b> Norway   |
| <input checked="" type="checkbox"/> <b>CR</b> Costa Rica                            | <input checked="" type="checkbox"/> <b>NZ</b> New Zealand  |
| <input checked="" type="checkbox"/> <b>CU</b> Cuba                                  | <input checked="" type="checkbox"/> <b>PL</b> Poland   |
| <input checked="" type="checkbox"/> <b>CZ</b> Czech Republic                        | <input checked="" type="checkbox"/> <b>PT</b> Portugal   |
| <input checked="" type="checkbox"/> <b>DE</b> Germany                               | <input checked="" type="checkbox"/> <b>RO</b> Romania  |
| <input checked="" type="checkbox"/> <b>DK</b> Denmark                               | <input checked="" type="checkbox"/> <b>RU</b> Russian Federation   |
| <input checked="" type="checkbox"/> <b>DM</b> Dominica                              | <input checked="" type="checkbox"/> <b>SD</b> Sudan  |
| <input checked="" type="checkbox"/> <b>DZ</b> Algeria                               | <input checked="" type="checkbox"/> <b>SE</b> Sweden   |
| <input checked="" type="checkbox"/> <b>EE</b> Estonia                               | <input checked="" type="checkbox"/> <b>SG</b> Singapore  |
| <input checked="" type="checkbox"/> <b>ES</b> Spain                                 | <input checked="" type="checkbox"/> <b>SI</b> Slovenia   |
| <input checked="" type="checkbox"/> <b>FI</b> Finland                               | <input checked="" type="checkbox"/> <b>SK</b> Slovakia   |
| <input checked="" type="checkbox"/> <b>GB</b> United Kingdom                        | <input checked="" type="checkbox"/> <b>SL</b> Sierra Leone   |
| <input checked="" type="checkbox"/> <b>GD</b> Grenada                               | <input checked="" type="checkbox"/> <b>TJ</b> Tajikistan   |
| <input checked="" type="checkbox"/> <b>GE</b> Georgia                               | <input checked="" type="checkbox"/> <b>TM</b> Turkmenistan   |
| <input checked="" type="checkbox"/> <b>GH</b> Ghana                                 | <input checked="" type="checkbox"/> <b>TR</b> Turkey   |
| <input checked="" type="checkbox"/> <b>GM</b> Gambia                                | <input checked="" type="checkbox"/> <b>TT</b> Trinidad and Tobago  |
| <input checked="" type="checkbox"/> <b>HR</b> Croatia                               | <input checked="" type="checkbox"/> <b>TZ</b> United Republic of Tanzania                                  |
| <input checked="" type="checkbox"/> <b>HU</b> Hungary                               | <input checked="" type="checkbox"/> <b>UA</b> Ukraine  |
| <input checked="" type="checkbox"/> <b>ID</b> Indonesia                             | <input checked="" type="checkbox"/> <b>UG</b> Uganda   |
| <input checked="" type="checkbox"/> <b>IL</b> Israel                                | <input checked="" type="checkbox"/> <b>US</b> United States of America                                     |
| <input checked="" type="checkbox"/> <b>IN</b> India                                 | <input checked="" type="checkbox"/> <b>UZ</b> Uzbekistan   |
| <input checked="" type="checkbox"/> <b>IS</b> Iceland                               | <input checked="" type="checkbox"/> <b>VN</b> Viet Nam   |
| <input checked="" type="checkbox"/> <b>JP</b> Japan                                 | <input checked="" type="checkbox"/> <b>YU</b> Yugoslavia   |
| <input checked="" type="checkbox"/> <b>KE</b> Kenya                                 | <input checked="" type="checkbox"/> <b>ZA</b> South Africa   |
| <input checked="" type="checkbox"/> <b>KG</b> Kyrgyzstan                            | <input checked="" type="checkbox"/> <b>ZW</b> Zimbabwe   |
| <input checked="" type="checkbox"/> <b>KP</b> Democratic People's Republic of Korea | Check-box reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> <b>KR</b> Republic of Korea                     | <input type="checkbox"/> .....   |
| <input checked="" type="checkbox"/> <b>KZ</b> Kazakhstan                            |  |

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM				
<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.				
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 28. September 1999 (28.09.1999)	199 46 307.7	DE		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

### Box No. VII INTERNATIONAL SEARCHING AUTHORITY

**Choice of International Searching Authority (ISA)**  
(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA /

**Request to use results of earlier search: reference to that search** (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)

Number

Country (or regional Office)

### Box No. VIII CHECK LIST: LANGUAGE OF FILING

This international application contains the following number of sheets:

request : 6  
description (excluding sequence listing part) : 9  
claims : 3  
abstract : 1  
drawings : 5  
sequence listing part of description :  
Total number of sheets : 24

This international application is accompanied by the item(s) marked below:

1. ☐ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney: reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☐ other (specify):

Figure of the drawings which should accompany the abstract:

3A

Language of filing of the international application:

English

### Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).  
Essen, September 28, 2000

The Patent Attorney:

  
(Dr. Horst Schumacher)

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	
6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>100 361</b>	<b>FOR FURTHER ACTION</b>		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. <b>PCT/EP00/09525</b>	International filing date ( <i>day/month/year</i> ) <b>28/09/2000</b>	Priority date ( <i>day/month/year</i> ) <b>28/09/1999</b>	
International Patent Classification (IPC) or national classification and IPC <b>B60J5/04</b>			
Applicant <b>MERITOR AUTOMOTIVE GMBH et al.</b>			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand  <b>27/04/2001</b>	Date of completion of this report  <b>30.01.2002</b>
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  <b>Sallard, F</b>  Telephone No. +49 89 2399 7299



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09525

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

1-9 as originally filed

### Claims, No.:

12 as originally filed

1-11 as received on 14/12/2001 with letter of 14/12/2001

### Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/09525

- ☐ the description,      pages:  
☐ the claims,      Nos.:  
☐ the drawings,      sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

- 2. Citations and explanations**  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Document EP-A-0 579 006, which is considered to represent the most relevant state of the art, discloses a vehicle door from which the subject-matter of claim 1 of the present application differs in that the outer panel is provided in at least part of its edge zones with a spacing element having adjustable dimensions for precisely positioned fastening of the outer panel to the support element of the door.

The subject-matter of claim 1 is therefore novel (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as an improvement of the perfectly fitted assembling for vehicle doors. In the prior art documents, there is no indication which would lead the skilled person to arrive at the present invention. Therefore, the solution to this problem proposed in claim 1 is considered as involving an inventive step (Article 33(3) PCT).

Claims 2-10 are dependent on claim 1. As such they also meet the requirements of the PCT with respect to novelty and inventive step.

The claims 11 and 12 define the method of assembling respectively disassembling the vehicle door of claims 1-10. Since such vehicle door is new and inventive, the subject-matter of both the claims 11 and 12 also meets the requirements of the PCT with respect to novelty and inventive step.

**Re Item VII**

**Certain defects in the international application**

- 1) In figure 5, the same reference sign (32) is applied to two different parts (Rule 10.2 PCT).
- 2) On page 7 resp. 8 of the description, identical reference signs (14 resp. 26D) are applied to different elements (Rule 10.2 PCT).



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP00/09525

- 3) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document EP-A-0 579 006 is not mentioned in the description, nor is this document identified therein.

**Re Item VIII**

**Certain observations on the international application**

Since "the stiffening element" in claim 1 (line 13) is not previously defined, the claim 1 is rendered unclear (Article 6 PCT).

Claims

① < having adjustable dimensions >

- 5 1. Vehicle door consisting of at least one support element (12), at least one outer panel element (14) and optionally an interior panel element (16), in which the support element (12) contains at least one hinge, hinge plate or similar moving element (18) and/or a closure element (20) or the support element (12) is or can be connected to the latter, wherein the support element (12) has a service opening (22) on its outer side (12A) and the service opening (22) can be closed off by means of the outer panel element (14), in particular, with the support element (12) already installed in the vehicle,
- 10 characterized in that the outer panel element (14) is or can be provided in at least part of its edge zones (14A) with an ~~adjustable~~ spacing element (26) <sup>①</sup> for precisely positioned fastening of the outer panel element (14) to the support element (12) and/or the stiffening element (24).
- 15 2. Vehicle door according to Claim 1, characterized in that the spacing element (26) is a settable plastic.
- 20 3. Vehicle door according to Claim 2, characterized in that the settable plastic is a heat-sensitive adhesive.
4. Vehicle door according to Claim 3, characterized in that the heat-sensitive adhesive is reversibly heat-sensitive.
- 25 5. Vehicle door according to any of the Claims 1 to 4, characterized in that the spacer element (26) also serves as connecting element of the outer panel element (14) with the support element (12) or with the stiffening element (24).

11

6. Vehicle door according to any of the Claims 1 to 5 characterized in that the spacer elements are movable and adjustable in at least two directions of space.

5 7. Vehicle door according to any of the Claims 1 to 6, characterized by at least one elongated, in particular, frame-shaped stiffening element (24) for the outer panel element (14) and/or the support element (12), preferably provided in the edge areas of the service opening.

10 8. Vehicle door according to any of the Claims 1 to 7, characterized in that the stiffening element (24) or the outer panel element can be detachably joined to the support element (12).

15 9. Vehicle door according to Claim 8, characterized in that the stiffening element (24) has a continuous sealing surface (24A) with respect to the support element (12).

20 10. Vehicle door according to any of Claims 1 to 9, characterized in that the support element (12) and the outer panel element (14) form, in particular, a completely enclosed hollow chamber (28).

25 11. Method of assembling a vehicle door according to any of Claims 1 to 10, characterized in that the preassembled vehicle door is firstly mounted and adjusted to the vehicle body and thereafter the outer panel element (14) of the door is brought into contact with an ~~adjustable~~ spacing element (26) <sup><O> and</sup> being intermediate to the mounted door, and thereafter bringing the outer panel element (14) into its final position under adjustment action of the adjustable spacing element (26), and then fixing the adjustable spacing element (26) in its final position or configuration.

30